

Sperry Drilling - HALLIBURTON

Directional Drilling End of Well Report



Australian Drilling Associates Pty Ltd



Well: Rockhopper-1 ST1
Rig: Kan Tan IV
Location: Bass Basin, Australia



Sperry Drilling - HALLIBURTON

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SECTION 1

Well Report

Operator : **Origin Energy Resources Ltd**

Well : **Rockhopper-1 ST1**

Job Objectives:

Rockhopper-1 ST1 is designed to intersect gas bearing sandstone units identified in Rockhopper-1 at a structurally down-dip location. The sidetrack will allow fluid pressure data and core to be obtained at a down-dip location over any significant gas-bearing reservoir intervals identified in Rockhopper-1. This information will enable gas-water contacts to be interpreted and when integrated with the core data, will be crucial to understanding the size and deliverability of the discovered resource

Summary of Results:

8 1/2" Hole Section BHA # 1 From 1998m to 2112m.

This Motor assembly was run to drill out the cement and build up to 10 degrees before the upcoming Geo-Pilot run. The Cement was drilled in good time with no problems. The Kick-off was initiated in the required direction and was controlled for the first stand to ensure good kick-off. The next few stands suffered from hanging up problems but were mitigated by back-reaming. Toolface control was reasonable and although ROP was slow the objective of a good kick off was met and drilling ceased at 2112m with 9.89 degrees in the hole at 180 Degrees azimuth. At surface the bit was found to be more worn than expected but could be re-run.

8 1/2" Hole Section BHA # 2 From 2112m to 3158 m.

This was a Geo-Pilot BHA and it was run to complete the build section at 33.34 Degrees inclination with Azimuth of 178 degrees. The build rate for this run was not as good as expected requiring 3.5 degree doglegs and working to get 3s. Almost the whole run was plagued by stick-slip and vibration and no parameters were found to mitigate this for any length of time. Some spurious down-links were found during vibration and extra vigilance had to be made to counteract the same. ROP was quite good considering the amount of time spent off bottom re-starting drilling in poor periods of stick-slip. This BHA held out despite all of this to 3158m some 30m short of core point and was pulled for no response to the tools. The bit was found to be in reasonable shape but about 1/16 under-gauge.

8 1/2" Hole Section BHA # 3 From 3158m to 3196m.

This BHA was run to find core point then be re-run to next core point and in turn to TD. This BHA also suffered from stick-slip and vibration. Again all parameters were adopted but it was such a short run with long intervals off bottom that it was impossible to report actual BHA tendencies. This BHA held inclination to core point at 3196m and was pulled for the coring run.

8 1/2" Hole Section BHA # 4 From 3196m to 3213mMD

This was the first core BHA and was deemed to be a success in that some 13.5m of core of interest was cut.

8 1/2" Hole Section BHA # 5 From 3213m to 3284mMD

This BHA only drilled 71 m MD and was very difficult to gauge its performance due to this however the general consensus was that it was marginally better at coping with stick-slip than BHA# 3. This BHA was different by way of having a new FMF3653Z PDC bit which may have helped stick-slip mitigation.

8 1/2" Hole Section BHA # 6 From 3283m to 3298.5mMD This BHA was run to retrieve the second core for Geological evaluation. This BHA recovered 14.08m of core, this was deemed to be insufficient and it was decided to run back in with another coring assembly to attempt to cut another 20m of core.

8 1/2" Hole Section BHA # 7 From 3298.5m to 3309mMD This BHA was run to retrieve the second core for Geological evaluation. This BHA recovered 9.50m of core, this was deemed to be sufficient for evaluation.

8 1/2" Hole Section BHA # 8 From 3309m to 3482m MD This BHA was a Geo-Pilot BHA and was used to drill the section after the core point to TD. Again massive stick-slip was recorded and when the volcanics formations came in this was to be further compounded by vibration also. All attempts were made to mitigate this but were unsuccessful. Despite this the tools made it to TD at 3482m MD. The subsequent trip out was good with little drag.

Discussion:

BHA #	Bit #	Motor Run #	Hole Size (in)	MD In (m)	MD Out (m)	TVD In (m)	TVD Out (m)	Inc In (deg)	Inc Out (deg)	Azi In (deg)	Azi Out (deg)	Drig hrs	Circ hrs
1	1	1	8.500	1998	2112	1998	2111	1.4	10.5	129	182	22	11
2	2	2	8.500	2112	3158	2111	2995	10.5	35.5	182	178	80	16
3	3	3	8.500	3158	3196	2995	3025	35.5	35.6	178	179	5	9
4	4		8.500	3196	3213	3025	3039	35.6	35.7	179	179	5	2
5	3rr1	4	8.500	3213	3283	3039	3096	35.7	35.3	179	178	10	4
6	4rr1		8.500	3283	3298	3096	3108	35.3	35.1	178	178	3	2
7	4rr2		8.500	3298	3309	3108	3117	35.1	35.5	178	178	2	2
8	3rr2	5	8.500	3309	3482	3117	3258	35.5	35.5	178	179	20	8

Table 1 - BHA Summary

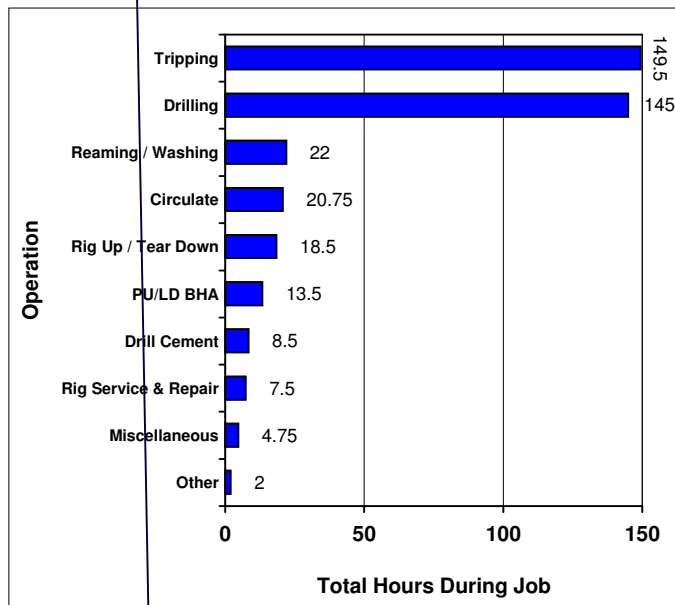
Motor Run #	Manufacturer	Type	Lobe	OD (in)	Gauge (in)	Bend (deg)	Adj	DLS (Ori) (%/30m)	ROP (Ori) (m/hr)	ROP (Rot) (m/hr)
1	SSDS	SperryDrill	7/8	6.750		1.15	Y	3.00	4	6
2	SSDS	Geopilot	/	6.750	8.375	0.00	N	0.30	0	13
3	SSDS	Geopilot	/	6.750	8.375	0.00	N		0	8
4	SSDS	Geopilot	/	6.750	8.375	0.00	N		0	7
5	SSDS	Geopilot	/	6.750	8.375	0.00	N	0.40	0	9

Table 2 - Motor Run Summary

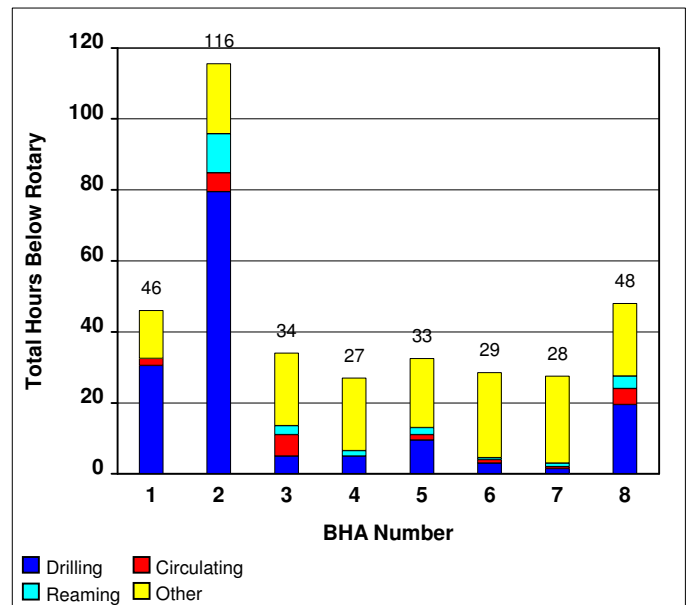
Bit #	Manufacturer	Style	OD (in)	Gge Len (in)	Nozzles (/32's)	TFA (in ²)	Dull Grades I O D L B G O R	Ftge (m)	Drig hrs	ROP (m/hr)
1	Hughes Christensen	MXL-1x	8.500			1.114	2-3-WT-A -2-I-ER-BHA	114	22.00	5
2	Reed Hycalog	RSX616M	8.500		6x18	1.491	2-1-CT-C--X-I-NO-DTF	1046	79.50	13
3	Security DBS	FMF3653Z	8.500	1.500	3x15, 3x12	0.849	0-0-NO-A -X-I-NO-CP	38	5.00	8
4	Corepro		8.500			0.000	0-0-NO-A -X-I-NO-PR	17	5.00	3
3rr1	Security DBS	FMF3653Z	8.500	1.500	3x15, 3x12	0.849	0-0-ER-A -X-I-NO-CP	70	9.50	7
4rr1	Corepro		8.500			0.000	0-0-NO-A -X-I-NO-PR	15	3.00	5
4rr2	Corepro		8.500			0.000	0-0-NO-A -X-I-NO-CP	11	1.50	7
3rr2	Security DBS	FMF3653Z	8.500	1.500	3x15, 3x12	0.849	0-0-RR-A -X-I-NO-TD	173	19.50	9

Table 3 - Bit Run Summary

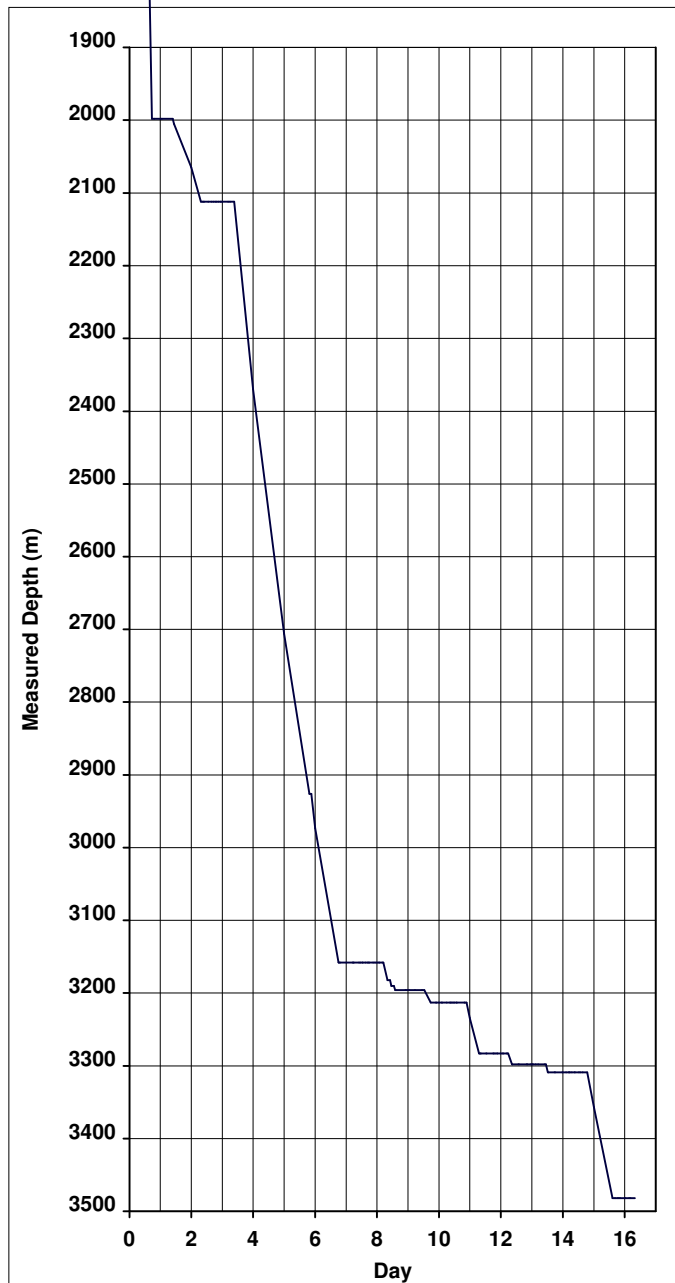
Hours by Operation Summary



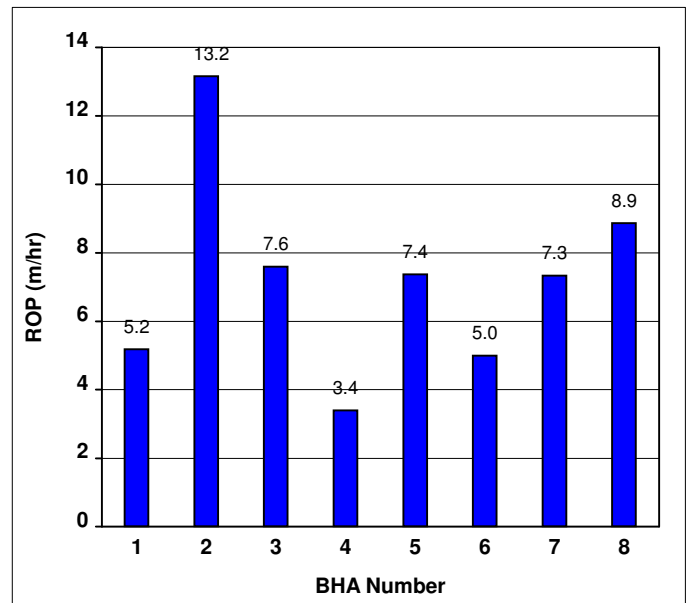
Hours per BHA Breakdown



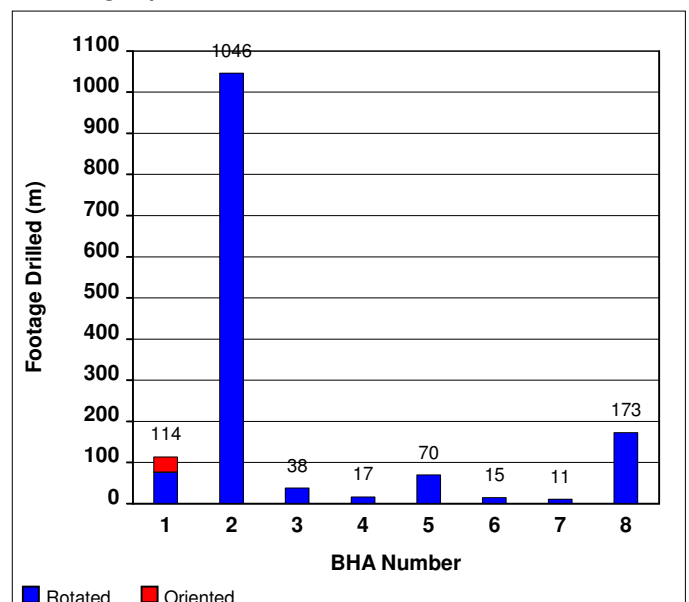
Days vs. Depth



Average Rate of Penetration per BHA



Footage per BHA



SECTION 2

Drilling Parameters

MD (m)	Formation Name MD/TVD	Inclination — DLS —	Bit Data	Drilling Parameters	Motor	BHA Stabilizers	Comments	BHA ID
100		0 10 20 30 40						@ 100
300								
500								
700								
900								
1100			MXL-1x 5.2 m/hr 22.00 hrs	WOB 22 klbs RPM 58 FLO 553 gpm SPP 1962 psi	6-3/4" SperryDrill 7/8 L 1.15° ABH	Stab @ 0.69 m 8.125 in @ 9.55 m 8.500 in @ 18.13 m	BRT 22:30 /19/01/10 ART 15:30/21/10/10	#1 @ 1998
1300			RSX616M 6x18 /32's 13.2 m/hr 79.50 hrs	WOB 16 klbs RPM 125 FLO 573 gpm SPP 2228 psi	Geopilot / L	8.375 in @ 1.18 m 8.404 in @ 10.77 m 8.250 in @ 20.43 m 8.500 in @ 40.01 m	Tools Initialized: 23:30hrs (BRT) ABG - 1.49m Den - 20.74m Son - 31.89m Svy - 8.74m Cal - 23.79m Gam - 11.51m Por - 24.64m Res - 13.86m PWD - 27.59m	#2 @ 2112
1500								
1700								
1900			FMF3653Z 3x15, 3x12 /32's 7.4 m/hr 5.00 hrs	WOB 10 klbs RPM 125 FLO 600 gpm SPP 2500 psi	Geopilot / L	8.375 in @ 1.13 m 8.375 in @ 10.63 m 8.125 in @ 20.99 m 8.500 in @ 42.37 m	Tools Initialized:26/10/10 14:55hrs (BRT) 23:00hrs 27/01/10 (ART) ABG - 1.45m Den - 21.29m ACAL - 39.17m Svy - 8.69m Por - 24.49m Gam - 11.36m PWD - 28.04m Res - 13.68m Son - 32.36m	#3 @ 3158
2100	Top EVCM Seismic 2068 / 2067			WOB 5 klbs RPM 120 FLO 600 gpm SPP 2340 psi		8.438 in @ 0.71 m 8.438 in @ 6.80 m 8.438 in @ 12.88 m 8.438 in @ 18.97 m 8.438 in @ 25.11 m 8.438 in @ 31.14 m		#4 @ 3196
2300								
2500			FMF3653Z 3x15, 3x12 /32's 7.4 m/hr 9.50 hrs	WOB 12 klbs RPM 166 FLO 592 gpm SPP 2404 psi	Geopilot / L	8.375 in @ 1.13 m 8.375 in @ 10.63 m 8.125 in @ 20.99 m 8.500 in @ 42.33 m	Tools Initialized: hrs (BRT)29/01/10 @11:40 - 30/01/10 @18:15(ART) ABG - 1.45m Den - 21.29m ACAL 39.13 m Svy - 8.69m Por - 24.49m Gam - 11.36m PWD - 28.04m Res - 13.68m Son - 32.32m	#5 @ 3213
2700				WOB 10 klbs RPM 105 FLO 600 gpm SPP 2450 psi		8.438 in @ 0.71 m 8.438 in @ 6.80 m 8.438 in @ 12.88 m 8.438 in @ 18.97 m 8.438 in @ 25.11 m 8.438 in @ 31.14 m		#6 @ 3283
2900	E1 Marker 2811 / 2710							
3100	P3/2973 Seismic 3115 / 2960			WOB 10 klbs RPM 100 FLO 600 gpm SPP 2450 psi		8.438 in @ 0.71 m 8.438 in @ 6.80 m 8.438 in @ 12.88 m 8.438 in @ 18.97 m 8.438 in @ 25.11 m 8.438 in @ 31.14 m		#7 @ 3298
3300			FMF3653Z 3x15, 3x12 /32's 8.9 m/hr 19.50 hrs	WOB 10 klbs RPM 140 FLO 600 gpm SPP 2505 psi	Geopilot / L	8.375 in @ 1.13 m 8.375 in @ 10.63 m 8.125 in @ 20.99 m 8.500 in @ 42.33 m	Tools Initialized: hrs (BRT) 02/02/10 @ 06:40 ABG - 1.45m Den - 21.29m ACAL 39.13 m Svy - 8.69m Por - 24.49m Gam - 11.36m PWD - 28.04m Res - 13.68m Son - 32.32m	#8 @ 3309
3500	Cretaceous Volcanics 3425 / 3211							

SECTION 3

Definitive Survey Report

Sperry Drilling

Origin Energy Resources LTD

Rockhopper-1

Rockhopper-1

Rockhopper-1

Rockhopper-1 ST

Design: Rockhopper-1 ST1 Definitive Survey

Standard Survey Report

02 March, 2010



Company:	Origin Energy Resources LTD	Local Co-ordinate Reference:	Well Rockhopper-1
Project:	Rockhopper-1	TVD Reference:	Rotary Table @ 26.00m (Above MSL)
Site:	Rockhopper-1	MD Reference:	Rotary Table @ 26.00m (Above MSL)
Well:	Rockhopper-1	North Reference:	Grid
Wellbore:	Rockhopper-1 ST	Survey Calculation Method:	Minimum Curvature
Design:	Rockhopper-1 ST1 Definitive Survey	Database:	EDM 2003.21 Sperry NZ DB21

Project	Rockhopper-1		
Map System:	Universal Transverse Mercator	System Datum:	Mean Sea Level
Geo Datum:	GDA94		
Map Zone:	Zone 55S (144 E to 150 E)		

Site		Rockhopper-1			
Site Position:		Northing:	5,594,071.42 m	Latitude:	39° 47' 34.1828 S
From:	Map	Easting:	366,374.03 m	Longitude:	145° 26' 21.4660 E
Position Uncertainty:	0.00 m	Slot Radius:	in	Grid Convergence:	1.00 °

Well		Rockhopper-1				
Well Position	+N/-S	0.00 m	Northing:	5,594,071.42 m	Latitude:	39° 47' 34.1828 S
	+E/-W	0.00 m	Easting:	366,374.03 m	Longitude:	145° 26' 21.4660 E
Position Uncertainty		0.00 m	Wellhead Elevation:	26.00 m	Water Depth:	74.30 m

Wellbore	Rockhopper-1 ST				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2009	4/12/2009	12.49	-70.39	60,969

Design	Rockhopper-1 ST1 Definitive Survey			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 1,968.42
Vertical Section:	Depth From (TVD) (m)	+N/-S (m)	+E/-W (m)	Direction (°)
	0.00	0.00	0.00	179.28

Survey Program	Date	2/03/2010			
From (m)	To (m)	Survey (Wellbore)	Tool Name	Description	
100.30	100.30	Rockhopper-1 - 36" MWD Survey (Rockho	MWD+SAG+SC	MWD + Sag + SC corrections (no bias)	
242.36	956.77	Rockhopper-1 - 17 1/2" MWD Survey (Roc	MWD+SAG+SC	MWD + Sag + SC corrections (no bias)	
980.35	1,951.76	Rockhopper-1 - 12 1/4" MWD Survey (Roc	MWD+SAG+SC	MWD + Sag + SC corrections (no bias)	
1,968.42	1,968.42	Rockhopper-1 - 8 1/2" MWD Survey (Rock	MWD+SAG+SC	MWD + Sag + SC corrections (no bias)	
1,995.26	3,482.00	Rockhopper-1 ST - 8 1/2" MWD Survey (R	MWD+SAG+SC	MWD + Sag + SC corrections (no bias)	

Survey										
Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	
100.30	0.00	0.00	100.30	0.00	0.00	0.00	0.000	0.00	0.00	
242.36	0.22	278.10	242.36	0.04	-0.27	-0.04	0.046	0.05	0.00	
327.42	0.34	318.42	327.42	0.25	-0.60	-0.26	0.079	0.04	14.22	
356.38	0.16	310.14	356.38	0.34	-0.69	-0.35	0.190	-0.19	-8.58	
414.83	0.43	334.58	414.83	0.59	-0.84	-0.60	0.150	0.14	12.54	
502.13	0.25	356.62	502.13	1.08	-1.00	-1.09	0.075	-0.06	7.57	
559.33	0.33	356.35	559.33	1.37	-1.01	-1.38	0.042	0.04	-0.14	
645.93	0.22	77.08	645.92	1.65	-0.87	-1.66	0.127	-0.04	27.97	

Company:	Origin Energy Resources LTD	Local Co-ordinate Reference:	Well Rockhopper-1
Project:	Rockhopper-1	TVD Reference:	Rotary Table @ 26.00m (Above MSL)
Site:	Rockhopper-1	MD Reference:	Rotary Table @ 26.00m (Above MSL)
Well:	Rockhopper-1	North Reference:	Grid
Wellbore:	Rockhopper-1 ST	Survey Calculation Method:	Minimum Curvature
Design:	Rockhopper-1 ST1 Definitive Survey	Database:	EDM 2003.21 Sperry NZ DB21

Survey									
Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)
733.40	0.10	264.51	733.39	1.68	-0.78	-1.69	0.110	-0.04	-59.19
819.33	0.13	204.11	819.32	1.59	-0.89	-1.60	0.041	0.01	-21.09
907.20	0.22	337.40	907.19	1.65	-1.00	-1.66	0.110	0.03	45.51
956.77	0.15	112.45	956.76	1.71	-0.98	-1.73	0.208	-0.04	81.73
961.00	0.12	112.45	960.99	1.71	-0.97	-1.72	0.191	-0.19	0.00
13 3/8" Casing									
980.35	0.00	258.48	980.34	1.70	-0.95	-1.71	0.191	-0.19	0.00
1,009.96	0.20	60.48	1,009.95	1.73	-0.90	-1.74	0.203	0.20	0.00
1,039.18	0.22	57.43	1,039.17	1.78	-0.81	-1.79	0.024	0.02	-3.13
1,068.02	0.25	56.38	1,068.01	1.85	-0.71	-1.86	0.032	0.03	-1.09
1,096.69	0.09	334.71	1,096.68	1.90	-0.67	-1.91	0.265	-0.17	-85.46
1,125.20	0.25	23.41	1,125.19	1.98	-0.65	-1.99	0.213	0.17	51.25
1,153.52	0.31	18.55	1,153.51	2.11	-0.61	-2.12	0.068	0.06	-5.15
1,182.12	0.26	64.52	1,182.11	2.21	-0.52	-2.22	0.238	-0.05	48.22
1,210.69	0.31	28.33	1,210.68	2.31	-0.43	-2.31	0.192	0.05	-38.00
1,239.34	0.36	49.88	1,239.33	2.43	-0.32	-2.44	0.141	0.05	22.57
1,298.15	0.40	29.51	1,298.14	2.73	-0.08	-2.73	0.071	0.02	-10.39
1,327.53	0.39	32.18	1,327.52	2.90	0.02	-2.90	0.021	-0.01	2.73
1,356.77	0.31	47.29	1,356.76	3.04	0.14	-3.04	0.125	-0.08	15.50
1,385.60	0.44	56.10	1,385.59	3.16	0.29	-3.15	0.148	0.14	9.17
1,412.81	0.48	46.30	1,412.80	3.29	0.45	-3.29	0.097	0.04	-10.80
1,441.66	0.57	57.51	1,441.65	3.45	0.66	-3.45	0.142	0.09	11.66
1,470.69	0.57	43.73	1,470.68	3.64	0.88	-3.63	0.141	0.00	-14.24
1,499.95	0.59	47.75	1,499.93	3.84	1.10	-3.83	0.046	0.02	4.12
1,529.47	0.61	56.99	1,529.45	4.03	1.34	-4.01	0.100	0.02	9.39
1,558.73	0.62	46.69	1,558.71	4.22	1.59	-4.20	0.114	0.01	-10.56
1,587.90	0.64	49.02	1,587.88	4.44	1.82	-4.42	0.033	0.02	2.40
1,616.89	0.68	52.55	1,616.87	4.65	2.08	-4.62	0.059	0.04	3.65
1,645.39	0.64	67.47	1,645.36	4.81	2.36	-4.78	0.185	-0.04	15.71
1,673.84	0.66	56.91	1,673.81	4.96	2.65	-4.93	0.128	0.02	-11.14
1,702.24	0.67	57.55	1,702.21	5.14	2.93	-5.11	0.013	0.01	0.68
1,759.92	0.72	70.24	1,759.89	5.45	3.55	-5.40	0.084	0.03	6.60
1,789.63	0.84	75.16	1,789.59	5.57	3.94	-5.52	0.139	0.12	4.97
1,848.62	0.80	79.00	1,848.58	5.75	4.76	-5.69	0.035	-0.02	1.95
1,876.78	0.90	76.63	1,876.73	5.84	5.17	-5.78	0.113	0.11	-2.52
1,905.30	0.76	78.61	1,905.25	5.93	5.57	-5.86	0.150	-0.15	2.08
1,934.76	0.91	50.85	1,934.71	6.12	5.94	-6.04	0.434	0.15	-28.27
1,951.76	0.68	51.65	1,951.71	6.27	6.13	-6.19	0.406	-0.41	1.41
1,964.00	0.69	56.15	1,963.95	6.35	6.25	-6.27	0.132	0.02	11.03
9 5/8" Casing									
1,968.42	0.69	57.75	1,968.37	6.38	6.29	-6.30	0.132	0.02	10.86
1,995.26	1.12	112.40	1,995.20	6.37	6.67	-6.28	1.022	0.48	61.09
2,020.27	4.56	164.56	2,020.18	5.32	7.16	-5.23	4.765	4.13	62.57
2,076.85	8.58	180.86	2,076.38	-1.08	7.70	1.17	2.329	2.13	8.64
2,097.43	9.89	180.78	2,096.70	-4.38	7.65	4.47	1.910	1.91	-0.12
2,101.74	10.33	180.02	2,100.94	-5.13	7.64	5.23	3.200	3.06	-5.29
2,133.86	11.00	184.57	2,132.50	-11.07	7.40	11.16	1.005	0.63	4.25
2,162.64	12.26	191.23	2,160.69	-16.80	6.58	16.89	1.917	1.31	6.94
2,191.04	14.09	193.69	2,188.35	-23.12	5.18	23.18	2.021	1.93	2.60
2,221.57	17.24	200.87	2,217.74	-30.96	2.69	30.99	3.629	3.10	7.06
2,249.96	21.12	203.77	2,244.55	-39.58	-0.87	39.56	4.221	4.10	3.06
2,279.09	25.17	203.19	2,271.33	-50.08	-5.43	50.01	4.178	4.17	-0.60
2,305.36	27.89	201.28	2,294.83	-60.94	-9.86	60.81	3.255	3.11	-2.18
2,335.32	29.38	198.65	2,321.13	-74.43	-14.76	74.24	1.954	1.49	-2.63

Company:	Origin Energy Resources LTD	Local Co-ordinate Reference:	Well Rockhopper-1
Project:	Rockhopper-1	TVD Reference:	Rotary Table @ 26.00m (Above MSL)
Site:	Rockhopper-1	MD Reference:	Rotary Table @ 26.00m (Above MSL)
Well:	Rockhopper-1	North Reference:	Grid
Wellbore:	Rockhopper-1 ST	Survey Calculation Method:	Minimum Curvature
Design:	Rockhopper-1 ST1 Definitive Survey	Database:	EDM 2003.21 Sperry NZ DB21

Survey										
Measured Depth (m)	Inclination (°)	Azimuth (°)	Vertical Depth (m)	+N/-S (m)	+E/-W (m)	Vertical Section (m)	Dogleg Rate (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	
2,364.04	31.58	195.91	2,345.88	-88.34	-19.07	88.10	2.718	2.30	-2.86	
2,393.22	33.12	193.25	2,370.53	-103.45	-22.99	103.16	2.156	1.58	-2.73	
2,424.12	34.46	191.99	2,396.21	-120.22	-26.74	119.88	1.468	1.30	-1.22	
2,453.55	35.45	189.16	2,420.33	-136.79	-29.83	136.41	1.936	1.01	-2.88	
2,483.19	36.74	186.44	2,444.28	-154.09	-32.20	153.68	2.082	1.31	-2.75	
2,512.34	35.42	185.57	2,467.84	-171.16	-33.99	170.72	1.457	-1.36	-0.90	
2,539.22	36.20	185.30	2,489.64	-186.82	-35.48	186.36	0.888	0.87	-0.30	
2,567.35	35.96	183.83	2,512.38	-203.33	-36.80	202.85	0.958	-0.26	-1.57	
2,596.63	35.85	183.27	2,536.09	-220.47	-37.87	219.98	0.355	-0.11	-0.57	
2,623.25	35.76	182.90	2,557.68	-236.02	-38.70	235.52	0.264	-0.10	-0.42	
2,653.75	34.92	179.74	2,582.56	-253.65	-39.11	253.14	1.978	-0.83	-3.11	
2,684.95	36.05	178.78	2,607.97	-271.76	-38.88	271.25	1.211	1.09	-0.92	
2,711.61	35.74	177.14	2,629.57	-287.38	-38.32	286.88	1.137	-0.35	-1.85	
2,739.68	35.53	177.12	2,652.38	-303.72	-37.50	303.22	0.225	-0.22	-0.02	
2,771.60	35.60	176.05	2,678.35	-322.25	-36.40	321.76	0.589	0.07	-1.01	
2,799.25	35.65	174.76	2,700.82	-338.30	-35.11	337.83	0.817	0.05	-1.40	
2,830.33	35.66	174.48	2,726.07	-356.34	-33.41	355.89	0.158	0.01	-0.27	
2,858.86	35.48	174.28	2,749.28	-372.85	-31.78	372.42	0.225	-0.19	-0.21	
2,886.55	35.51	174.82	2,771.83	-388.86	-30.26	388.45	0.341	0.03	0.59	
2,912.81	35.67	174.71	2,793.18	-404.08	-28.86	403.68	0.197	0.18	-0.13	
2,944.72	35.81	174.86	2,819.08	-422.64	-27.17	422.26	0.155	0.13	0.14	
2,970.13	33.67	176.07	2,839.96	-437.07	-26.02	436.71	2.654	-2.53	1.43	
3,001.24	33.20	177.20	2,865.92	-454.18	-25.01	453.83	0.752	-0.45	1.09	
3,026.70	33.66	177.54	2,887.17	-468.19	-24.37	467.85	0.585	0.54	0.40	
3,059.36	34.73	177.11	2,914.18	-486.53	-23.51	486.20	1.008	0.98	-0.39	
3,089.54	35.58	176.65	2,938.86	-503.88	-22.57	503.56	0.885	0.84	-0.46	
3,118.07	35.65	177.66	2,962.05	-520.47	-21.74	520.16	0.623	0.07	1.06	
3,145.40	35.32	177.16	2,984.31	-536.32	-21.02	536.02	0.482	-0.36	-0.55	
3,167.94	35.69	178.03	3,002.66	-549.40	-20.48	549.10	0.834	0.49	1.16	
3,185.27	35.70	178.52	3,016.73	-559.51	-20.17	559.21	0.495	0.02	0.85	
3,203.43	35.56	178.76	3,031.49	-570.08	-19.92	569.79	0.327	-0.23	0.40	
3,234.73	35.91	179.25	3,056.90	-588.36	-19.60	588.07	0.433	0.34	0.47	
3,264.81	35.73	178.72	3,081.29	-605.96	-19.29	605.67	0.358	-0.18	-0.53	
3,293.65	35.03	178.07	3,104.80	-622.65	-18.82	622.37	0.827	-0.73	-0.68	
3,324.89	36.06	178.66	3,130.22	-640.81	-18.31	640.53	1.043	0.99	0.57	
3,350.05	35.41	178.82	3,150.64	-655.50	-17.98	655.22	0.783	-0.78	0.19	
3,379.25	35.71	179.95	3,174.40	-672.48	-17.80	672.20	0.742	0.31	1.16	
3,408.14	35.85	180.50	3,197.84	-689.37	-17.87	689.09	0.364	0.15	0.57	
3,439.04	36.10	180.75	3,222.84	-707.52	-18.07	707.24	0.281	0.24	0.24	
3,467.05	35.47	179.36	3,245.56	-723.90	-18.08	723.61	1.101	-0.67	-1.49	
3,482.00	35.47	179.36	3,257.74	-732.57	-17.99	732.29	0.000	0.00	0.00	
Projected to TD										

Casing Points					
Measured Depth (m)	Vertical Depth (m)	Name	Casing Diameter (in)	Hole Diameter (in)	
1,964.00	1,963.95	9 5/8" Casing	9.625	12.250	
961.00	960.99	13 3/8" Casing	13.375	17.500	

Company:	Origin Energy Resources LTD	Local Co-ordinate Reference:	Well Rockhopper-1
Project:	Rockhopper-1	TVD Reference:	Rotary Table @ 26.00m (Above MSL)
Site:	Rockhopper-1	MD Reference:	Rotary Table @ 26.00m (Above MSL)
Well:	Rockhopper-1	North Reference:	Grid
Wellbore:	Rockhopper-1 ST	Survey Calculation Method:	Minimum Curvature
Design:	Rockhopper-1 ST1 Definitive Survey	Database:	EDM 2003.21 Sperry NZ DB21

Design Annotations				
Measured Depth (m)	Vertical Depth (m)	Local Coordinates		Comment
		+N/-S (m)	+E/-W (m)	
3,482.00	3,257.74	-732.57	-17.99	Projected to TD

Checked By: _____	Approved By: _____	Date: _____
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SECTION 4

A4 Plot

Sperry Drilling

Project: Rockhopper-1
Site: Rockhopper-1
Well: Rockhopper-1
Wellbore: Rockhopper-1 ST
Design: Rockhopper-1 ST1 Definitive Survey

Origin energy

WELL DETAILS: Rockhopper-1 ST1

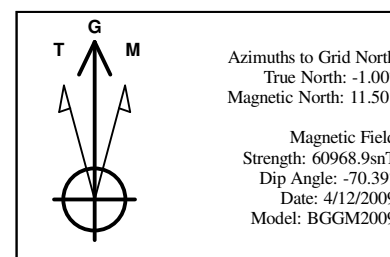
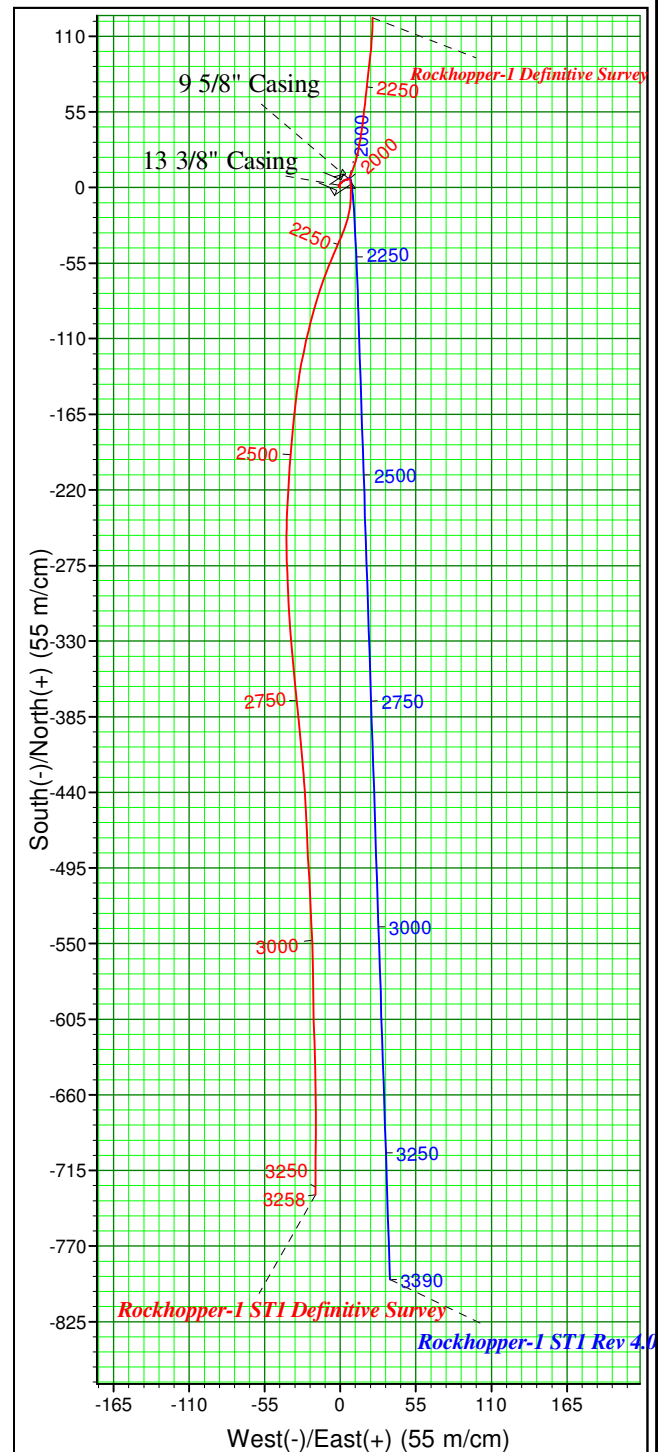
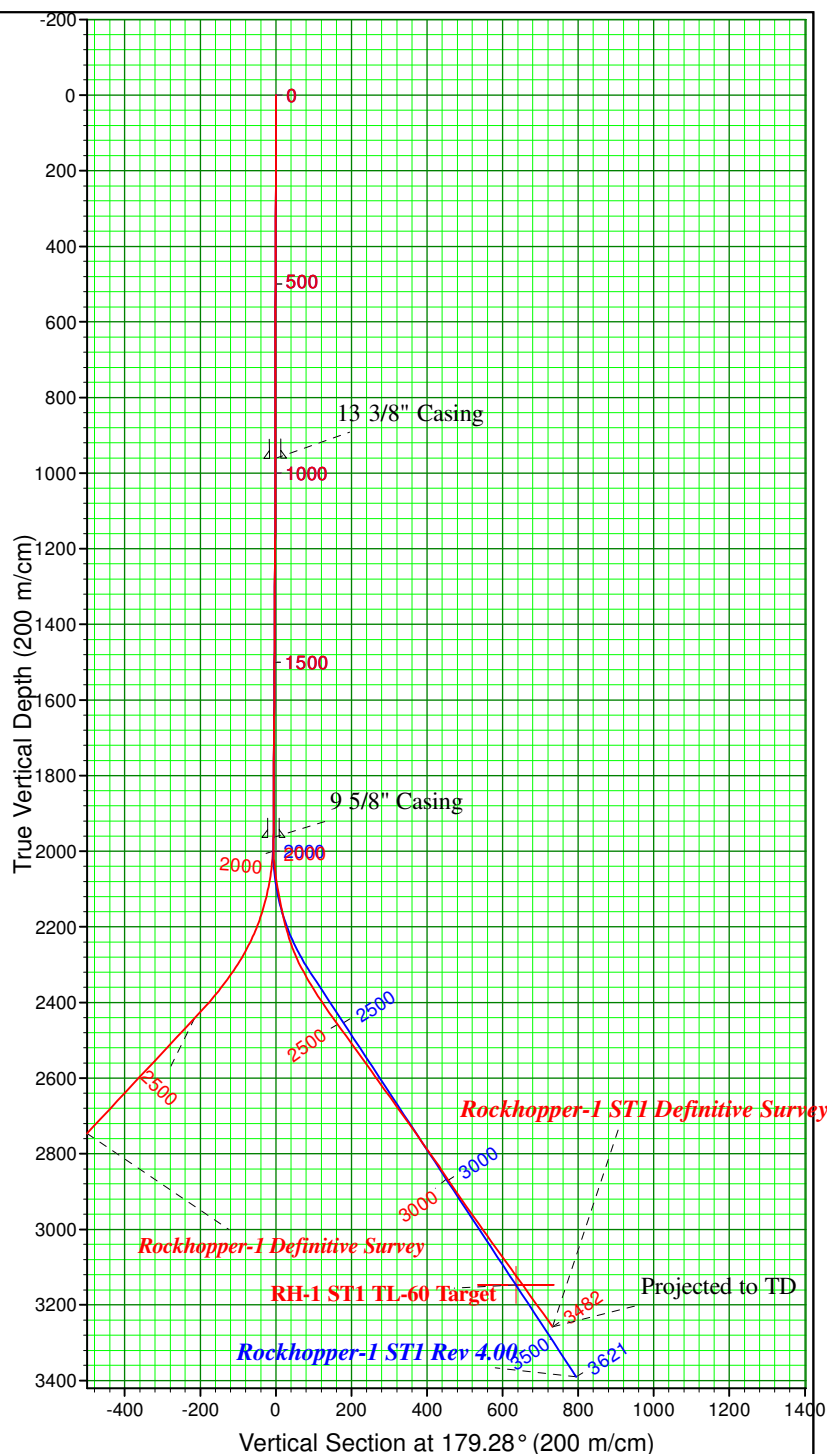
+N/-S	+E/-W	Northing	Water Depth: 74.30	Easting	Latitude	Longitude
0.00	0.00	5594071.42		366374.039° 47'	34.1828 S	45° 26' 21.4660 E

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Rockhopper-1, Grid North
Vertical (TVD) Reference: Rotary Table @ 26.00m (Above MSL)
Section (VS) Reference: Slot - (0.00N, 0.00E)
Measured Depth Reference: Rotary Table @ 26.00m (Above MSL)
Calculation Method: Minimum Curvature

CASING DETAILS

TVD	MD	Name	Size
960.99	961.00	13 3/8" Casing	13.375
1963.95	1964.00	9 5/8" Casing	9.625



PROJECT DETAILS: Rockhopper-1

Geodetic System: Universal Transverse Mercator
Datum: GDA94
Ellipsoid: GRS 1980
Zone: Zone 55S (144 E to 150 E)

System Datum: Mean Sea Level

SECTION 5

Drilling Surveys

Operator : Origin Energy Resources Ltd
Well : Rockhopper-1 ST1
Rig : Kan Tan IV

Country : Australia
Location : Bass Basin
Job # : AU-DD-0006791008

Page : 1

North Ref : Mag Declination : ° VS Dir : 179.28° (from Wellhead)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates N/S E/W (m)		DLS (%/30m)	Build Rate (%/30m)	Turn Rate (%/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation From (m) To (m)		Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00										Tieon
1968.42	0.69	57.75	1968.4	-6.3	6.4	6.3	0.00	0.00	0.00										Tieon
1995.26	1.12	112.40	1995.2	-6.3	6.4	6.7	1.02	0.48	0.00	4		550	2100	1990	1995	LS			
2020.27	4.56	164.56	2020.2	-5.2	5.3	7.2	4.77	4.13	62.57	30		550	1960	1995	1996	LS		1	
														1996	2005	LS		1	
														2020	2020	LS		1	
2076.85	8.58	180.86	2076.4	1.2	-1.1	7.7	2.33	2.13	8.64	22		550	1920	2020	2033	LS		1	
														2070	2077	HS		1	
2097.43	9.89	180.78	2096.7	4.5	-4.4	7.6	1.91	1.91	-0.12	20	60	550	1900	2077	2080	HS	10	1	
2101.74	10.33	180.02	2100.9	5.2	-5.1	7.6	3.20	3.06	-5.29	20	60	550	1900	2098	2100	HS	10	1	
2133.86	11.00	184.57	2132.5	11.2	-11.1	7.4	1.00	0.63	4.25	20	120	550	1950	2102	2104	HS	22	2	TF 10L Def 75%
														2106	2108	HS		2	
														2110	2112	HS		2	
2162.64	12.26	191.23	2160.7	16.9	-16.8	6.6	1.92	1.31	6.94	20	120	550	1950				22	2	TF 20L Def 90%
2191.04	14.09	193.69	2188.4	23.2	-23.1	5.2	2.02	1.93	2.60	20	120	550	1950				22	2	TF 20L Def 100%
2221.57	17.24	200.87	2217.7	31.0	-31.0	2.7	3.63	3.10	7.06	25	140	550	1950				10	2	TF 20L Def 100%
2249.96	21.12	203.77	2244.6	39.6	-39.6	-0.9	4.22	4.10	3.06	25	150	550	1950				36	2	TF 30L Def 100%
2279.09	25.17	203.19	2271.3	50.0	-50.1	-5.4	4.18	4.17	-0.60	20	120	550	1950				55	2	TF 45L Def 90%
2305.36	27.89	201.28	2294.8	60.8	-60.9	-9.9	3.26	3.11	-2.18	20	130	550	1950				40	2	TF 45L Def 90%
2335.32	29.38	198.65	2321.1	74.2	-74.4	-14.8	1.95	1.49	-2.63	16	130	525	1850				14	2	TF 45L Def 95%
2364.04	31.58	195.91	2345.9	88.1	-88.3	-19.1	2.72	2.30	-2.86	16	130	525	1850				14	2	TF 45L Def 90%
2393.22	33.12	193.25	2370.5	103.2	-103.5	-23.0	2.16	1.58	-2.73	16	130	525	1850				14	2	TF 35L Def 100%
2424.12	34.46	191.99	2396.2	119.9	-120.2	-26.7	1.47	1.30	-1.22	21	130	525	1900				10	2	TF 45L Def 100%
2453.55	35.45	189.16	2420.3	136.4	-136.8	-29.8	1.94	1.01	-2.88	21	120	530	1940				16	2	TF 45L Def 100%
2483.19	36.74	186.44	2444.3	153.7	-154.1	-32.2	2.08	1.31	-2.75	21	120	530	1940				16	2	TF 45L Def 100%
2512.34	35.42	185.57	2467.8	170.7	-171.2	-34.0	1.46	-1.36	-0.90	15	120	550	2250				11	2	CR 70% Def -30 Bias
2539.22	36.20	185.30	2489.6	186.4	-186.8	-35.5	0.89	0.87	-0.30	15	120	550	2250				11	2	CR 90% Def -30 Bias
2567.35	35.96	183.83	2512.4	202.9	-203.3	-36.8	0.96	-0.26	-1.57	15	120	550	2250				11	2	CR 90% Def -30 Bias
2596.63	35.85	183.27	2536.1	220.0	-220.5	-37.9	0.35	-0.11	-0.57	15	120	550	2250				11	2	CR 90% Def -30 Bias
2623.25	35.76	182.90	2557.7	235.5	-236.0	-38.7	0.26	-0.10	-0.42	15	115	600	2280				21	2	CR 90% Def -30 Bias

sperry-sun

DRILLING SERVICES

Survey and Drilling Parameters

Operator : Origin Energy Resources Ltd
Well : Rockhopper-1 ST1
Rig : Kan Tan IV

Country : Australia
Location : Bass Basin
Job # : AU-DD-0006791008

North Ref : Mag **Declination :** ° **VS Dir :** 179.28° (from Wellhead)

WELLBORE SURVEY										DRILLING PARAMETERS									
Measured Depth (m)	Incl Angle (deg)	Azi Dir (deg)	Vertical Depth (m)	Vertical Section (m)	Coordinates		DLS (°/30m)	Build Rate (°/30m)	Turn Rate (°/30m)	WOB (klbs)	RPM	Flow Rate (gpm)	Stand Pipe (psi)	Orientation		Tool Face (deg)	ROP (m/hr)	BHA No. (#)	Comment
					N/S (m)	E/W (m)								From (m)	To (m)				
2653.75	34.92	179.74	2582.6	253.1	-253.7	-39.1	1.98	-0.83	-3.11	15	130	600	2300				30	2	TF 40L Def 100%
2684.95	36.05	178.78	2608.0	271.3	-271.8	-38.9	1.21	1.09	-0.92	13	135	610	2420				24	2	TF 20L Def 100%
2711.61	35.74	177.14	2629.6	286.9	-287.4	-38.3	1.14	-0.35	-1.85	10	140	610	2450				48	2	CR 90% Def -40 Bias
2739.68	35.53	177.12	2652.4	303.2	-303.7	-37.5	0.22	-0.22	-0.02	20	120	610	2450				18	2	CR 90% Def -40 Bias
2771.60	35.60	176.05	2678.4	321.8	-322.2	-36.4	0.59	0.07	-1.01	13	135	610	2470				20	2	CR 90% Def -40 Bias
2799.25	35.65	174.76	2700.8	337.8	-338.3	-35.1	0.82	0.05	-1.40	20	135	610	2520				14	2	CR 90% Def -40 Bias
2830.33	35.66	174.48	2726.1	355.9	-356.3	-33.4	0.16	0.01	-0.27	20	135	610	2520				14	2	CR 90% Def -30 Bias
2858.86	35.48	174.28	2749.3	372.4	-372.9	-31.8	0.23	-0.19	-0.21	15	140	600	2450				10	2	CR 90% Def -30 Bias
2886.55	35.51	174.82	2771.8	388.4	-388.9	-30.3	0.34	0.03	0.59	12	140	600	2450				11	2	CR 90% Def -30 Bias
2912.81	35.67	174.71	2793.2	403.7	-404.1	-28.9	0.20	0.18	-0.13	15	110	610	2450				11	2	CR 90% Def -30 Bias
2944.72	35.81	174.86	2819.1	422.3	-422.6	-27.2	0.16	0.13	0.14	15	125	590	2430				12	2	CR 90% Def -30 Bias
2970.10	33.67	176.07	2839.9	436.7	-437.1	-26.0	2.66	-2.53	1.43	15	130	590	2450				12	2	TF 30L Def 100%
3001.24	33.20	177.20	2865.9	453.8	-454.2	-25.0	0.75	-0.45	1.09	15	130	590	2450				12	2	TF 20L Def 100%
3026.70	33.66	177.54	2887.2	467.9	-468.2	-24.4	0.59	0.54	0.40	15	120	590	2450				11	2	TF 20L Def 100%
3059.36	34.73	177.11	2914.2	486.2	-486.5	-23.5	1.01	0.98	-0.39	12	120	590	2450				10	2	TF 20L Def 100%
3089.54	35.58	176.65	2938.9	503.6	-503.9	-22.6	0.88	0.84	-0.46	12	100	590	2430				10	2	CR 100% Bias -30
3118.07	35.65	177.66	2962.1	520.2	-520.5	-21.7	0.62	0.07	1.06	12	100	590	2430				10	2	CR 100% Bias -30
3145.40	35.32	177.16	2984.3	536.0	-536.3	-21.0	0.48	-0.36	-0.55	10	100	590	2430				11	2	CR @100% Bias -30
3167.94	35.69	178.03	3002.7	549.1	-549.4	-20.5	0.83	0.49	1.16	10	125	600	2500				10	3	CR @100% Bias -30
3185.27	35.70	178.52	3016.7	559.2	-559.5	-20.2	0.50	0.02	0.85	10	125	600	2500				25	3	CR @100% Bias -20
3203.43	35.56	178.75	3031.5	569.8	-570.1	-19.9	0.32	-0.23	0.38	5	120	600	2340				4	4	CR @100% Bias -30
3234.73	35.91	179.25	3056.9	588.1	-588.4	-19.6	0.44	0.34	0.48	10	165	580	2350				5	5	CR @100% Bias -30
3264.81	35.73	178.72	3081.3	605.7	-606.0	-19.3	0.36	-0.18	-0.53	15	170	600	2450				13	5	CR @100% Bias -30
3295.65	35.03	178.07	3106.4	623.5	-623.8	-18.8	0.77	-0.68	-0.63	10	100	600	2450				12	6	Home
3324.89	36.06	178.66	3130.2	640.5	-640.8	-18.3	1.11	1.06	0.61	10	150	600	2360				12	8	CR @100% Bias -30
3350.05	35.41	178.82	3150.7	655.2	-655.5	-18.0	0.78	-0.78	0.19	5	170	600	2360				8	8	CR @100% Bias -30
3379.25	35.71	179.95	3174.4	672.2	-672.5	-17.8	0.74	0.31	1.16	10	160	600	2460				7	8	CR @100% Bias -30
3408.14	35.85	180.50	3197.8	689.1	-689.4	-17.9	0.36	0.15	0.57	15	140	600	2490				15	8	CR @100% Bias -30
3439.04	36.10	180.75	3222.9	707.2	-707.5	-18.1	0.28	0.24	0.24	10	120	600	2490				15	8	CR @100% Bias -30
3467.05	35.47	179.36	3245.6	723.6	-723.9	-18.1	1.10	-0.67	-1.49	10	120	600	2490				15	8	HOME
3482.00	35.47	179.36	3257.7	732.3	-732.6	-18.0	0.00	0.00	0.00	10	120	600	2490				10	8	Projected to TD

SECTION 6

BHA Data

sperry-sun

DRILLING SERVICES

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 1

BHA# 1 : Date In :19/01/201 MD In (m) : 1998 TVD In (m) : 1998 Date Out 21/01/201(MD Out (m): 2112 TVD Out(m): 2111

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
1	8.500	Hughes Christensen	MXL-1x	6062641		1.114	2-3-WT-A -2-I-ER-BHA

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
1	6.750	SSDS	SperryDrill	675400	1.15°		63	32.50

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	8 1/2" Hughes Mill Tooth Bit	6062641	8.500	3.000	8.500	169.30	P 4-1/2" Reg	0.24	
2	6-3/4" SperryDrill Lobe 6/7 - 5.0 stg	675400	6.750	4.498		67.81	B 4-1/2" IF	8.29	0.69
3	8-1/8" Integral Blade Stabilizer	10988869	6.750	2.813	8.125	100.77	B 4-1/2" IF	2.03	9.55
4	6-3/4"PM Sub	194443	6.750	1.920		112.09	B 4-1/2" IF	2.78	
5	6-3/4" HOC	203842	6.750	1.920		112.09	B 4-1/2" IF	3.03	
6	Float Sub w/- Ported Float	11029122	6.750	3.000		97.86	B 4-1/2" IF	0.91	
7	8-1/2" Integral Blade Stabilizer	700802	6.500	2.813	8.500	91.91	B 4-1/2" IF	1.70	18.13
8	6x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	56.16	
9	9x HWDP		5.000	3.000		49.30	B 4-1/2" IF	84.57	
10	6-1/2" Drilling Jars	17602177	6.500	2.750		92.85	B 4-1/2" IF	9.84	
11	5x HWDP		5.000	3.000		49.30	B 4-1/2" IF	47.18	
								216.73	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	20	35	22	Drilling :	22.00	in Air (Total) : 48291			
RPM (rpm) :	50	65	58	Reaming :	0.00	in Mud (Total) : 41372			
Flow (gpm) :	550	600	553	Circ-Other :	10.50	in Air (Bel Jars) : 37663			
SPP (psi) :	1890	2200	1962	Total :	32.50	in Mud (Bel Jars) : 32267			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)	1.36	10.54	Oriented :	38.00	4		3.00
Azimuth (deg)	129.23	181.54	Rotated :	76.00	6		
			Total :	114.00	5	2.41	13.76
							2.57

COMMENTS

BRT 22:30 /19/01/10

ART 15:30/21/10/10

Operator : Origin Energy Resources Ltd**Well :** Rockhopper-1 ST1**Country :** Australia**Location :** Bass Basin**Rig :** Kan Tan IV**Job # :** AU-DD-0006791008**BHA# 1****OBJECTIVES:**

To drill the Cement down to the kick -off point and then orientate the well to 180 degrees south and build some angle of up to 10 degrees before the upcoming Geo-Pilot BHA run.

RESULTS:

The BHA was run in to the top of the Cement at 1970m MD and was drilled with no problems in good time to 1990m MD where the motor was orientated to 180 Degrees and the well was control drilled for the kick -off. The ROP was controlled until 1998m MD where it was confirmed that samples showed 98% formation and kick-off was initiated

The next stand was also control drilled to gain some angle in the hole F 1998-2033m .Sliding mode gave slow ROP and only realised just over 1 degree from a 13m slide .Again a 10m slide was put in and this time realised a 4 degree dog-leg and so with this the slide ratio was reduced .In Slide mode hanging up became a regular occurrence requiring the well to be back-reamed which had a negative effect on ROP and actual on bottom drilling time however tool-face control was reasonable. The well was successfully kicked -off in the required direction .Once the well was drilled to approximately (Projected) 10 Degrees and after discussion with the company Rep it was decided that this was enough angle in the hole to be confident that the BHA could be pulled and the subsequent Geo-Pilot could commence for the remainder of the well to core point .The actual depth and inclination at this point was 2112m and 8.58 degrees .

The subsequent trip out of the hole was good and there was no back-reaming required and there were no tight spots or other such hole problems .The bit for this run was surprisingly more worn than expected and the motor was in good shape with only 1mm of bearing wear .

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 2

BHA# 2 : Date In 21/01/201 MD In (m) : 2112 TVD In (m) : 2111 Date Out 26/01/201(MD Out (m): 3158 TVD Out(m): 2995

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
2	8.500	Reed Hycalog	RSX616M	220126	6x18	1.491	2-1-CT-C--X-I-NO-DTF

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
2	6.750	SSDS	Geopilot	GP850TL103	0.00°		0	95.75

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Reed Hycalog RSX616M PDC	220126	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.44	
2	7600 Geo-Pilot w/- LSH	GP850TL103	6.750	1.920	8.375	112.09	B 4-1/2" IF	7.08	1.18
3	6-3/4" NM Flex with PCDC	CP1005711	6.750	1.920		112.09	B 4-1/2" IF	2.81	
4	6 3/4 RLL Stab	1016171	6.750	1.920	8.404	112.09	B 4-1/2" IF	0.67	10.77
5	6-3/4" RLL w/DGR + EWR	90232556	6.750	1.920		106.76	B 4-1/2" IF	6.54	
6	6 3/4 ALD C/W Stab	902300556	6.750	1.920	8.250	112.09	B 4-1/2" IF	4.32	20.43
7	6-3/4" CTN + ACAL	902300556	6.750	1.920		112.09	B 4-1/2" IF	4.22	
8	6-3/4" PWD	90222556	6.750	1.920		112.09	B 4-1/2" IF	2.54	
9	6- BAT- Sonic	90230519	6.750	1.920		112.09	B 4-1/2" IF	6.68	
10	6-3/4" HOC	203846	6.750	1.920		112.09	B 4-1/2" IF	3.04	
11	6-3/4" Float Sub w/- Ported Float	11029122	6.750	3.000		97.86	B 4-1/2" IF	0.91	
12	8-1/2" Integral Blade Stabilizer	700802	6.500	2.875	8.500	90.96	B 4-1/2" IF	1.70	40.01
13	3x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	27.92	
14	9x HWDP		5.000	3.000		49.30	B 4-1/2" IF	84.57	
15	6-1/2" Drilling Jar	17602177	6.500	2.750		92.85	B 4-1/2" IF	9.84	
16	5x HWDP		5.000	3.000		49.30	B 4-1/2" IF	47.18	
								210.46	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	10	25	16	Drilling :	79.50	in Air (Total) : 48329			
RPM (rpm) :	80	150	125	Reaming :	11.00	in Mud (Total) : 41405			
Flow (gpm) :	525	610	573	Circ-Other :	5.25	in Air (Bel Jars) : 37701			
SPP (psi) :	1850	2520	2228	Total :	95.75	in Mud (Bel Jars) : 32299			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)	10.54	35.53	Oriented :	0.00	0		0.30
Azimuth (deg)	181.54	177.65	Rotated :	1046.00	13	0.20	0.20
			Total :	1046.00	13	0.72	-0.11
							0.72

COMMENTS

Tools Initialized: 23:30hrs (BRT)
 ABG - 1.49m Den - 20.74m Son - 31.89m
 Svy - 8.74m Cal - 23.79m
 Gam - 11.51m Por - 24.64m
 Res - 13.86m PWD - 27.59m

Operator : Origin Energy Resources Ltd**Well** : Rockhopper-1 ST1**Country** : Australia**Location** : Bass Basin**Rig** : Kan Tan IV**Job #** : AU-DD-0006791008**BHA# 2****OBJECTIVES:**

To continue directionally drilling 8 1/2" hole section to TD building inclination and turning azimuth with an average dogleg of 3 degree/30m. This BHA will be run to drill to the first core point then on to the second core point and then to TD as picked by Geology

RESULTS:

The BHA was run to bottom with no hole problems. Response was reasonable throughout the run but was hampered by vibration and stick-slip resulting in pulling off bottom to send down -links at times .. Steering mode was used for the build up section, from 2112m to 2500m, then switched to cruise mode for the remainder of the well other than a two or three occasions when it was put back in to steering mode to combat right hand bit walk . Effective dog leg produced was only 3+ degrees per 30m requiring 100% deflection and lower flow-rate to maintain same .

During the run high stick slip and torsional vibration exposed all tools to extremely high levels of shock. Every possible effort was endeavoured to mitigate stick slip and torsional vibration with limited success. Appeared the bit was generating the down hole torque .The formation was very inter-bedded and despite constant variation of parameters and best drilling practices being used it was almost impossible to stop, resulting in periods off bottom to allow energy out of the string before re-attempting to drill ahead

Frequent false downlinks were received by Geo-Pilot believed to be initiated by the perceived stick-slip down hole. Some down-links could not be sent due to stick-slip and so some were sent while off bottom and stationary before drilling ahead .In the later section of the well downlinks were sent after the survey to ensure the tool was set before drilling ahead .This BHA was pulled when communication was lost at he RLL tools was lost due to the massive stick-slip shocks sustained during this section .The subsequent trip out of the hole was without problems and the bit was worn more than expected from this run.

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 3

BHA# 3 : Date In 26/01/201 MD In (m) : 3158 TVD In (m) : 2995 Date Out 28/01/201(MD Out (m): 3196 TVD Out(m): 3025

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in²)	Dull Condition
3	8.500	Security DBS	FMF3653Z	11374625	3x15, 3x12	0.849	0-0-NO-A-X-I-NO-CP

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
3	6.750	SSDS	Geopilot	GP850TL134	0.00°		0	13.50

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	SDBS FMF3653Z PDC	11374625	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.39	
2	7600 Geo-Pilot w/- LSH	GP850TL134	6.750	1.920	8.375	112.09	B 4-1/2" IF	7.08	1.13
3	6-3/4" NM Flex with PCDC	CP919968	6.750	1.920		112.09	B 4-1/2" IF	2.76	
4	6-3/4" RLL w/- Stab	90224657	6.750	1.920	8.375	112.09	B 4-1/2" IF	0.62	10.63
5	6-3/4" RLL w/DGR + EWR	90224657	6.750	1.920		106.76	B 4-1/2" IF	6.53	
6	6-3/4" ALD w/- Stab	902300556	6.750	1.920	8.125	112.09	B 4-1/2" IF	4.99	20.99
7	6-3/4" CTN	902322813	6.750	1.920		112.09	B 4-1/2" IF	4.15	
8	6-3/4" PWD	90215164	6.750	1.920		112.09	B 4-1/2" IF	2.53	
9	6- BAT- Sonic	90235228	6.750	1.920		112.09	B 4-1/2" IF	6.72	
10	6-3/4" HOC	302842	6.750	1.920		112.09	B 4-1/2" IF	3.03	
11	6-3/4" ACAL	90235611	6.750	1.920		112.09	B 4-1/2" IF	1.81	
12	6-3/4" Float Sub w/- Ported Float	11029122	6.750	3.000		97.86	B 4-1/2" IF	0.91	
13	8-1/2" Integral Blade Stabilizer	700802	6.500	2.875	8.500	90.96	B 4-1/2" IF	1.70	42.37
14	3x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	27.92	
15	9x HWDP		5.000	3.000		49.30	B 4-1/2" IF	84.57	
16	6-1/2" Drilling Jar	17602177	6.500	2.750		92.85	B 4-1/2" IF	9.84	
17	5x HWDP		5.000	3.000		49.30	B 4-1/2" IF	47.18	
								212.73	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	10	10	10	Drilling :	5.00	in Air (Total) : 49154			
RPM (rpm) :	125	125	125	Reaming :	2.50	in Mud (Total) : 42186			
Flow (gpm) :	600	600	600	Circ-Other :	6.00	in Air (Bel Jars) : 38525			
SPP (psi) :	2500	2500	2500	Total :	13.50	in Mud (Bel Jars) : 33064			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)	35.53	35.62	Oriented :	0.00	0		
Azimuth (deg)	177.65	178.66	Rotated :	38.00	8		
			Total :	38.00	8	0.07	0.80
							0.47

COMMENTS

Tools Initialized:26/10/10 14:55hrs (BRT) 23:00hrs 27/01/10 (ART)
 ABG - 1.45m Den - 21.29m ACAL - 39.17m
 Svy - 8.69m Por - 24.49m
 Gam - 11.36m PWD - 28.04m
 Res - 13.68m Son - 32.36m

Operator : Origin Energy Resources Ltd**Well :** Rockhopper-1 ST1**Country :** Australia**Location :** Bass Basin**Rig :** Kan Tan IV**Job # :** AU-DD-0006791008**BHA# 3****OBJECTIVES:**

To drill 30m to the first core point 100m to the second core point and then to TD at 3630m +/- holding tangent angle and landing to the south of the target TL 60

RESULTS:

This BHA was run to bottom and the hole was re-logged on the way down at the same time. The hole packed off at a few points on the way down which were specifically 3150md and 3152md. Once on bottom drilling began in inclination cruise with a 30 L bias to negate the right hand turn expected from the bit. This section was to be drilled to core point as picked by Geologist. The first drilled depth was F 3158m 3180m MD where the pipe was reciprocated until logs were sent and samples obtained for Geology. This section also suffered from stick-slip and lateral vibration and all attempts were made to mitigate same but the parameters found to minimise this also slowed ROP to an unacceptable 1-1.5m/hr and so again parameters were modified to regain an acceptable ROP while minimising stick-slip. Again this was not successful.

The second drilled depth was F3180m-3190m MD as directed by Geology for the core point and once again the pipe was reciprocated while logs were sent and samples got for Geology. This section was the same as before with lateral vibration and stick-slip always present. The parameters were constantly modified to try and prevent this but once again was unsuccessful. This was considered to be core point and the BHA was tripped out of hole. There were no problems on the trip out. The Geo-Pilot performed as expected.

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 4

BHA# 4 : Date In 28/01/201 MD In (m) : 3196 TVD In (m) : 3025 Date Out 29/01/201(MD Out (m): 3213 TVD Out(m): 3039

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in ²)	Dull Condition
4	8.500	Corepro		83691		0.000	0-0-NO-A-X-I-NO-PR

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	83691	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.37	
2	Stabilizer	WO137258	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	0.71
3	Outer Core Barrel	WO135-256	7.125	5.625		51.19	B 4-1/2" IF	5.33	
4	Stabilizer	WO137-237	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	6.80
5	Outer Core Barrel	WO135264	7.125	5.625		51.19	B 4-1/2" IF	5.33	
6	Stabilizer	WO137-015	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	12.88
7	Outer Core Barrel	WO135-1974	7.125	5.625		51.19	B 4-1/2" IF	5.33	
8	Stabilizer	WO137-219	6.500	5.625	8.438	28.40	B 4-1/2" IF	0.76	18.97
9	Outer Core Barrel	WO135-098	7.125	5.625		51.19	B 4-1/2" IF	5.33	
10	Stabilizer	WO137-219	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	25.11
11	Outer Core Barrel	WO135-098	7.063	1.938		123.47	B 4-1/2" IF	5.33	
12	Stabilizer	WO1476014	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	31.14
13	Top Head	wo1856027	7.063	2.875		111.40	B 4-1/2" IF	0.60	
14	6x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	56.16	
15	6-1/2" Drilling Jar	17602019	6.500	2.750		92.85	B 4-1/2" IF	9.94	
16	2 x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	18.78	
17	15 x 5" HWDP		5.000	3.000		49.30	B 4-1/2" IF	141.19	
								258.25	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	5	5	5	Drilling :	5.00	in Air (Total) : 57119			
RPM (rpm) :	120	120	120	Reaming :	1.50	in Mud (Total) : 49022			
Flow (gpm) :	600	600	600	Circ-Other :	0.00	in Air (Bel Jars) : 25103			
SPP (psi) :	2340	2340	2340	Total :	6.50	in Mud (Bel Jars) : 21545			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (%/30m)	Turn (%/30m)	DLS (%/30m)
Inclination (deg)	35.62	35.67	Oriented :	0.00	0		0.00
Azimuth (deg)	178.66	178.90	Rotated :	17.00	3	0.00	0.00
			Total :	17.00	3	0.09	0.44
							0.27

COMMENTS

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Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 4

OBJECTIVES:

To retrieve 30m of core F 3196m-3226m MD

RESULTS:

This was core BHA and was a success in that the 13.4m of core recovered was deemed to be good enough to drill ahead to second core point for evaluation .

sperry-sun

DRILLING SERVICES

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 5

BHA# 5 : Date In 29/01/201 MD In (m) : 3213 TVD In (m) : 3039 Date Out 30/01/201(MD Out (m): 3283 TVD Out(m): 3096

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in ²)	Dull Condition
3rr1	8.500	Security DBS	FMF3653Z	11374625	3x15, 3x12	0.849	0-0-ER-A -X-I-NO-CP

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
4	6.750	SSDS	Geopilot	GP850TL134	0.00°		0	26.50

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	SDBS FMF3653Z PDC	11374625	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.39	
2	7600 Geo-Pilot w/- LSH	GP850TL134	6.750	1.920	8.375	112.09	B 4-1/2" IF	7.08	1.13
3	6-3/4" NM Flex with PCDC	CP919968	6.750	1.920		112.09	B 4-1/2" IF	2.76	
4	6-3/4" RLL w/- Stab	90224657	6.750	1.920	8.375	112.09	B 4-1/2" IF	0.62	10.63
5	6-3/4" RLL w/DGR + EWR	90224657	6.750	1.920		106.76	B 4-1/2" IF	6.53	
6	6-3/4" ALD w/- Stab	902300556	6.750	1.920	8.125	112.09	B 4-1/2" IF	4.99	20.99
7	6-3/4" CTN	902322813	6.750	1.920		112.09	B 4-1/2" IF	4.15	
8	6-3/4" PWD	90215164	6.750	1.920		112.09	B 4-1/2" IF	2.53	
9	6- BAT- Sonic	90230519	6.750	1.920		112.09	B 4-1/2" IF	6.68	
10	6-3/4" HOC	302842	6.750	1.920		112.09	B 4-1/2" IF	3.03	
11	6-3/4" ACAL	90235611	6.750	1.920		112.09	B 4-1/2" IF	1.81	
12	6-3/4" Float Sub w/- Ported Float	11029122	6.750	3.000		97.86	B 4-1/2" IF	0.91	
13	8-1/2" Integral Blade Stabilizer	700802	6.500	2.875	8.500	90.96	B 4-1/2" IF	1.70	42.33
14	3x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	27.92	
15	9x HWDP		5.000	3.000		49.30	B 4-1/2" IF	84.57	
16	6-1/2" Drilling Jar	17602177	6.500	2.750		92.85	B 4-1/2" IF	9.84	
17	5x HWDP		5.000	3.000		49.30	B 4-1/2" IF	47.18	
								212.69	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	5	15	12	Drilling :	9.50	in Air (Total) : 49139			
RPM (rpm) :	120	170	166	Reaming :	2.00	in Mud (Total) : 42099			
Flow (gpm) :	580	600	592	Circ-Other : 1.50		in Air (Bel Jars) : 38511			
SPP (psi) :	2330	2450	2404	Total : 13.00		in Mud (Bel Jars) : 32993			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)	35.67	35.32	Oriented :	0.00	0		
Azimuth (deg)	178.90	178.34	Rotated :	70.00	7		
			Total :	70.00	7	-0.15	-0.24
							0.21

COMMENTS

Tools Initialized: hrs (BRT)29/01/10 @11:40 - 30/01/10 @18:15(ART)

ABG - 1.45m Den - 21.29m ACAL 39.13 m

Svy - 8.69m Por - 24.49m

Gam - 11.36m PWD - 28.04m

Res - 13.68m Son - 32.32m

Operator : Origin Energy Resources Ltd**Well** : Rockhopper-1 ST1**Country** : Australia**Location** : Bass Basin**Rig** : Kan Tan IV**Job #** : AU-DD-0006791008**BHA# 5****OBJECTIVES:**

This BHA will be run to continue tangent section to prognosed core point number 2 then continue to hold tangent angle and inclination to through target TL60 and to TD at 3630m+/_md

RESULTS:

This BHA was the same as BHA#3 other than the Bat-sonic was run .The bit was the same as the previous run which was such a short run that it was difficult to get a feel for the characteristics of it .This BHA was tripped to bottom with no problems and the hole was clean on the trip in .The bit was broken in on bottom to try and establish a new pattern on bottom where the core BHA had left off .Once broken in the RPM was brought up to 155RPM in order to try and minimise stick-slip ,and then on to 170 RPM seen at surface which was deemed to be as fast as the rotary could be turned .Stick-slip was still an issue but marginally less than before .Again varying parameters were attempted and it appeared that 140RPM with 20K WOB seemed to settle the stick-slip, however this was short lived .

Many combinations of WOB and RPM were adopted but as stated earlier only slightly better than before .Again this was only a short run F 3213m -3284m(71m) and again it was very difficult gauge BHA characteristics but overall on this run it would seem to have been an improvement on the previous BHA.

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 6

BHA# 6 : Date In 30/01/201 MD In (m) : 3283 TVD In (m) : 3096 Date Out 1/02/2010 MD Out (m): 3298 TVD Out (m): 3108

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in ²)	Dull Condition
4rr1	8.500	Corepro		83691		0.000	0-0-NO-A-X-I-NO-PR

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	83691	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.37	
2	Stabilizer	WO137258	6.750	5.625	8.438	37.26	B 4-1/2" Reg	0.76	0.71
3	Outer Core Barrel	WO135-256	7.125	5.625		51.19	B 4-1/2" IF	5.33	
4	Stabilizer	WO137-237	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	6.80
5	Outer Core Barrel	WO135264	7.125	5.625		51.19	B 4-1/2" IF	5.33	
6	Stabilizer	WO137-015	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	12.88
7	Outer Core Barrel	WO135-1974	7.125	5.625		51.19	B 4-1/2" IF	5.33	
8	Stabilizer	WO137-219	6.500	5.625	8.438	28.40	B 4-1/2" IF	0.76	18.97
9	Outer Core Barrel	WO135-098	7.125	5.625		51.19	B 4-1/2" IF	5.33	
10	Stabilizer	WO137-219	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	25.11
11	Outer Core Barrel	WO135-098	7.063	1.938		123.47	B 4-1/2" IF	5.33	
12	Stabilizer	WO1476014	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	31.14
13	Top Head	wo1856027	7.063	2.875		111.40	B 4-1/2" IF	0.60	
14	6x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	56.16	
15	6-1/2" Drilling Jar	17602019	6.500	2.750		92.85	B 4-1/2" IF	9.94	
16	2 x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	18.78	
17	15 x 5" HWDP		5.000	3.000		49.30	B 4-1/2" IF	141.19	
								258.25	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	10	13	10	Drilling :	3.00	in Air (Total) : 57119			
RPM (rpm) :	100	170	105	Reaming :	0.50	in Mud (Total) : 48935			
Flow (gpm) :	600	600	600	Circ-Other :	1.00	in Air (Bel Jars) : 25103			
SPP (psi) :	2450	2450	2450	Total :	4.50	in Mud (Bel Jars) : 21506			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (%/30m)	Turn (%/30m)	DLS (%/30m)
Inclination (deg)	35.32	35.11	Oriented :	0.00	0		
Azimuth (deg)	178.34	178.12	Rotated :	15.00	5		
			Total :	15.00	5	-0.41	-0.44
							0.48

COMMENTS

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Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 6

OBJECTIVES:

This BHA will be run to recover 50-70m of core as picked by Geology.

RESULTS:

This BHA cut core from 3283m to 3298.5m before it became jammed. Assembly was then pulled out of hole and 14.08m of core was recovered and was considered not to be enough for evaluation and so a third run would be done..

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 7

BHA# 7 : Date In : 1/02/2010 MD In (m) : 3298 TVD In (m) : 3108 Date Out : 2/02/2010 MD Out (m) : 3309 TVD Out (m) : 3117

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in ²)	Dull Condition
4rr2	8.500	Corepro		83691		0.000	0-0-NO-A-X-I-NO-CP

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	Core Head	83691	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.37	
2	Stabilizer	WO137258	6.750	5.625	8.438	37.26	B 4-1/2" Reg	0.76	0.71
3	Outer Core Barrel	WO135-256	7.125	5.625		51.19	B 4-1/2" IF	5.33	
4	Stabilizer	WO137-237	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	6.80
5	Outer Core Barrel	WO135264	7.125	5.625		51.19	B 4-1/2" IF	5.33	
6	Stabilizer	WO137-015	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	12.88
7	Outer Core Barrel	WO135-1974	7.125	5.625		51.19	B 4-1/2" IF	5.33	
8	Stabilizer	WO137-219	6.500	5.625	8.438	28.40	B 4-1/2" IF	0.76	18.97
9	Outer Core Barrel	WO135-098	7.125	5.625		51.19	B 4-1/2" IF	5.33	
10	Stabilizer	WO137-219	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	25.11
11	Outer Core Barrel	WO135-098	7.063	1.938		123.47	B 4-1/2" IF	5.33	
12	Stabilizer	WO1476014	6.750	5.625	8.438	37.26	B 4-1/2" IF	0.76	31.14
13	Top Head	wo1856027	7.063	2.875		111.40	B 4-1/2" IF	0.60	
14	6x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	56.16	
15	6-1/2" Drilling Jar	17602019	6.500	2.750		92.85	B 4-1/2" IF	9.94	
16	2 x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	18.78	
17	15 x 5" HWDP		5.000	3.000		49.30	B 4-1/2" IF	141.19	
								258.25	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	10	10	10	Drilling :	1.50	in Air (Total) : 57119			
RPM (rpm) :	100	100	100	Reaming :	1.00	in Mud (Total) : 48935			
Flow (gpm) :	600	600	600	Circ-Other :	0.50	in Air (Bel Jars) : 25103			
SPP (psi) :	2450	2450	2450	Total :	3.00	in Mud (Bel Jars) : 21506			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (%/30m)	Turn (%/30m)	DLS (%/30m)
Inclination (deg)	35.11	35.50	Oriented :	0.00	0		
Azimuth (deg)	178.12	178.34	Rotated :	11.00	7		
			Total :	11.00	7	1.06	0.61
							1.11

COMMENTS

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Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 7

OBJECTIVES:

This BHA will be run to retrieve another 20 m of core if possible due to the previous core sample being shorter than expected

RESULTS:

This BHA cut core from 3298.5m to 3309m before it became jammed. Assembly was then pulled out of hole and 9.50m of core was recovered.

sperry-sun

DRILLING SERVICES

BHA Report

Operator : Origin Energy Resources Ltd

Well : Rockhopper-1 ST1

Country : Australia

Location : Bass Basin

Rig : Kan Tan IV

Job # : AU-DD-0006791008

BHA# 8

BHA# 8 : Date In 2/02/2010 MD In (m) : 3309 TVD In (m) : 3117 Date Cur 4/02/2010 MD Cur (m): 3482 TVD Cur (m): 3258

BIT DATA

Bit #	OD (in)	MFR	Style	Serial#	Nozzles (/32's)	TFA (in ²)	Dull Condition
3rr2	8.500	Security DBS	FMF3653Z	11374625	3x15, 3x12	0.849	0-0-RR-A-X-I-NO-TD

MOTOR DATA

Run #	OD (in)	MFR	Model	Serial#	Bend	Nzl (/32's)	Avg Dif (psi)	Cum Circ Hrs
5	6.750	SSDS	Geopilot	GP850TL134	0.00°		68	54.00

COMPONENT DATA

Item #	Description	Serial #	OD (in)	ID (in)	Gauge (in)	Weight (lbs/ft)	Top Con	Length (m)	Bit - Center Blade (m)
1	SDBS FMF3653Z PDC	11374625	8.500	2.500	8.500	176.66	P 4-1/2" Reg	0.39	
2	7600 Geo-Pilot w/- LSH	GP850TL134	6.750	1.920	8.375	112.09	B 4-1/2" IF	7.08	1.13
3	6-3/4" NM Flex with PCDC	CP919968	6.750	1.920		112.09	B 4-1/2" IF	2.76	
4	6-3/4" RLL w/- Stab	90224657	6.750	1.920	8.375	112.09	B 4-1/2" IF	0.62	10.63
5	6-3/4" RLL w/DGR + EWR	90224657	6.750	1.920		106.76	B 4-1/2" IF	6.53	
6	6-3/4" ALD w/- Stab	902300556	6.750	1.920	8.125	112.09	B 4-1/2" IF	4.99	20.99
7	6-3/4" CTN	902322813	6.750	1.920		112.09	B 4-1/2" IF	4.15	
8	6-3/4" PWD	90215164	6.750	1.920		112.09	B 4-1/2" IF	2.53	
9	6- BAT- Sonic	90230519	6.750	1.920		112.09	B 4-1/2" IF	6.68	
10	6-3/4" HOC	302842	6.750	1.920		112.09	B 4-1/2" IF	3.03	
11	6-3/4" ACAL	90235611	6.750	1.920		112.09	B 4-1/2" IF	1.81	
12	6-3/4" Float Sub w/- Ported Float	11029122	6.750	3.000		97.86	B 4-1/2" IF	0.91	
13	8-1/2" Integral Blade Stabilizer	700802	6.500	2.875	8.500	90.96	B 4-1/2" IF	1.70	42.33
14	3x Drill collar		6.750	2.875		99.83	B 4-1/2" IF	27.92	
15	9x HWDP		5.000	3.000		49.30	B 4-1/2" IF	84.57	
16	6-1/2" Drilling Jar	17602019	6.500	2.750		92.85	B 4-1/2" IF	9.94	
17	5x HWDP		5.000	3.000		49.30	B 4-1/2" IF	47.18	
								212.79	

Parameter	Min	Max	Ave	Activity	Hrs	BHA Weight (lb)	Drill String	OD(in)	Len (m)
WOB (klbs) :	5	15	10	Drilling :	19.50	in Air (Total) : 49170			
RPM (rpm) :	80	170	140	Reaming :	3.50	in Mud (Total) : 42125			
Flow (gpm) :	600	600	600	Circ-Other :	4.50	in Air (Bel Jars) : 38511			
SPP (psi) :	2360	3260	2505	Total :	27.50	in Mud (Bel Jars) : 32993			

PERFORMANCE

	In	Out	Distance(m)	ROP (m/hr)	Build (°/30m)	Turn (°/30m)	DLS (°/30m)
Inclination (deg)	35.50	35.47	Oriented :	0.00	0		0.40
Azimuth (deg)	178.34	179.36	Rotated :	173.00	9	0.30	0.30
			Total :	173.00	9	-0.01	0.18
							0.10

COMMENTS

Tools Initialized: hrs (BRT) 02/02/10 @ 06:40
 ABG - 1.45m Den - 21.29m ACAL 39.13 m
 Svy - 8.69m Por - 24.49m
 Gam - 11.36m PWD - 28.04m
 Res - 13.68m Son - 32.32m

Operator : Origin Energy Resources Ltd**Well** : Rockhopper-1 ST1**Country** : Australia**Location** : Bass Basin**Rig** : Kan Tan IV**Job #** : AU-DD-0006791008**BHA# 8****OBJECTIVES:**

This BHA will be run to drill from the core point at 3309m to Prognosed TD at 3620m intersecting the Target TL -60 holding inclination and direction as required for the target.

RESULTS:

This BHA has been run before and after the core point .Again from the outset this BHA suffered from stick -slip as it had done on the previous runs .The stick-slip seen was severe and varying parameters were adopted to try and mitigate it .From the core point at 3309m MD the parameters were 5-15K WOB with 120-170 RPM being the range with periods off bottom to allow the inertia out of the string before re-starting drilling .These parameters were modified almost continuously and at times 120-130 RPM and 10-15K WOB seemed to be the best for a while but was short lived and again severe stick -slip was seen .The rig heave during this was almost as much as the rig was designed for and the compensator seemed to struggle to keep up with the heave and only compounded the stick-slip as keeping a constant weight on bit was extremely difficult if not impossible.

At around 3430m MD the formation changed and the volcanic formations were coming in which not only gave the same stick-slip issues but was now coupled with vibration also .Once again parameters were changed and modified as necessary but it was only minimised as far as possible and not mitigated .ROP during this section was average 10m/hr and although the Geo-Pilot was run out of specification it made the run to TD at 3482m MD as advised by Geologist .The Subsequent trip out of the hole was good with just about 15k drag at some points but easily worked through.